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ABSTRACT

This report describes a program promoting gender equity in classroom participation to ensure the active engagement of all students. Targeted population consisted of eighth-grade health classes and ninth and tenth grade biology classes. Gender inequities in class participation were documented by behavioral checklists, anecdotal records, and student attitude surveys. According to the literature, possible causes for the problem include development of gender roles in which females tend to have lower self esteem, fewer teacher contacts, and higher anxiety levels than males. Behavioral checklists revealed that boys were receiving more teacher attention, made more declarative statements, and exhibited more disruptive behavior than girls. A review of solution strategies presented in the literature, combined with an analysis of the problem setting, resulted in development of a 3-point plan of action. The first intervention examined the existence of the problem, and classroom procedures were then established to ensure equal participation. The second intervention was to develop activities that encourage increased participation by girls. Finally, students received direct instruction in cooperation and participation. Post-intervention data indicated an increase in the level of girls' participation, a decrease in disruptive behavior by all students, improvement in targeted social skills, and equal distribution of teacher time and attention by gender. Appendices contain various materials used in the project, including surveys, checklists, and rubrics. (Contains 7 tables of data, 6 figures, and 39 references.) (Author/BT)

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STRATEGIES FOR ENSURING GENDER EQUITY IN THE CLASSROOM

Jo Owens

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Saint Xavier University & IRI/Skylight

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ABSTRACT

This project describes a program promoting gender equity in classroom participation in order to ensure the active engagement of all students. The targeted population consisted of eighth grade health classes and ninth and tenth grade biology classes. Gender inequities in class participation were documented by behavioral checklists, anecdotal records, and student attitude surveys.

According to the literature, possible causes for the problem include development of gender roles in which females tend to have lower self-esteem, fewer teacher contacts and higher anxiety levels than boys. Behavioral checklists revealed that boys were receiving more teacher attention, made more declarative statements, and exhibited more disruptive behavior than the girls.

A review of solution strategies presented in the literature, combined with an analysis of the problem setting, resulted in the development of a three point plan of action. The first intervention examined the existence of the problem and classroom procedures were then established to ensure equal participation. The second intervention was to develop activities that encourage increased participation by girls. Finally, students received direct instruction in cooperation and participation.

Post intervention data indicated an increase in the level of participation by girls, a decrease in disruptive behavior by all students, improvement in targeted social skills and equal distribution of teacher time and attention by gender.

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CHAPTER 1

PROBLEM STATEMENT AND CONTEXT

General Statement of the Problem

The students of the targeted eighth grade health class and the ninth and tenth grade biology class exhibit unequal participation by gender. Evidence for the existence of the problem includes audiotape records (Appendix A) that demonstrate gender differences in verbal participation, numerous checklists (Appendices B-D) that document unequal demands for the teacher's attention, student attitude surveys related to their participation, an analysis of textbooks that indicate gender bias, and an analysis of course enrollment that reflects gender inequities.

Immediate Problem Context

Site A, a middle school, and site B, a high school, are both located within affluent suburban communities. Table 1 describes the student populations of both sites. The student bodies are predominately white, with less than 10% consisting of black, Hispanic, and other minority groups. Site A has a total enrollment of 579 students and Site B has a total enrollment of 1,216 students (School Report Card, 1996).

Table 1

Racial/Ethnic Background of Students at Site A and Site B

Location	White	Black	Hispanic	Asian/ P. Islander	Native American	Total Enrollment
Site A	94.1%	1.4%	1.4%	2.6%	0.5%	579
Site B	91.0%	1.6%	1.8%	5.6%	0.0%	1,216

The percentages of low-income students in Site A and B are 1.9% and 1.0% respectively. Low-income students are from "families receiving public aid" or "living in institutions for neglected or delinquent children. . ." (School Report Card, 1996, p. 2). The percentages of limited-English-proficient students, those who are qualified for a bilingual program, is similarly low (1.9% in Site A and 0.5% in Site B).

Attendance patterns for Site A and B are summarized in Table 2. Both sites exhibit higher attendance rates, lower student mobility, and lower chronic truancy than state averages (School Report Card, 1996).

Table 2

Attendance, Mobility, and Chronic Truancy at Site A and Site B

Location	Attendance	Student Mobility	Chronic Truancy
Site A	95.2%	6.7%	0.0%
Site B	94.6%	6.2%	0.7%
State	93.5%	18.8%	2.3%

Of the 62 teachers at Site A, 75.8% are female and 24.2% are male. Of the 95 teachers at Site B, 44.8% are female, and 55.2% are male (School Report Card, 1996). Teachers in the districts of Site A and Site B are predominately white (see Table 3).

Table 3

Teachers by Racial/Ethnic Background and Gender at Site A and Site B

Location	White	Black	Hispanic	Asian/ P. Islander	Total Number
Site A	98.4%	0.0%	1.3%	0.3%	315
Site B	96.0%	2.1%	1.9%	0.0%	95

Over 70% of teachers in both districts have a master's degree or above (see Table 4). The pupil-teacher ratio in the districts of Site A and Site B is 15.1:1 and 14.1:1 respectively.

Table 4

Teacher Characteristics at Site A and Site B

Location	Average Teaching Experience	Teachers with Bachelor's Degree	Teachers with Master's & Above	Pupil-Teacher Ratio
Site A	13.8	29.1%	70.9%	15.2:1
Site B	16.9	20.6%	79.4%	14.1:1

Site A is a 40 year old facility that serves grades six through eight. Some of the building's features include two gymnasiums, two cafeterias, an auditorium, and a two-story instructional materials center. The core curriculum at Site A includes science, math, reading, social studies, language arts, foreign languages, and physical education. In addition, an extensive exploratory program consisting of fine and applied arts courses is offered. In this program, students sample various disciplines including drama, video production, keyboarding, life skills, foreign language, music, art, and advisory. For gifted students, courses in the humanities and advanced math are offered. Special needs students are served by both classroom teachers and specialists. The district has just instituted a dual-language immersion program in which students from across the district are brought together to learn English and Spanish in a bilingual classroom.

Site B was originally built in 1935. Recently renovated, it now contains over 90 classrooms, two state-of-the art IBM computer labs, a Macintosh computer lab, fine arts facilities (including an auditorium and studio theater), and a large competition gymnasium and Olympic sized pool. Of the more than 170 course titles offered at Site B, most are considered college preparatory courses. Advanced Placement and honors level courses are also offered for academically gifted students. Juniors and seniors have the opportunity to explore specific topics in

depth through an Independent Study program. The special education program provides academic, social, and emotional support for qualified students.

The Surrounding Community

Site A's school community serves two culturally and economically diverse towns (see Table 5). These towns share and celebrate their ethnic heritages. The larger town, in which Site A is located, is predominately white, affluent, and contributes 69% of the total district enrollment. It has a higher median family income and the average single family home is valued at $358,837. The smaller town has greater ethnic and economic diversity. The school community includes eight elementary schools, three middle schools, and one high school.

Site B's school district serves students from two neighboring towns. The largest town, in which Site B is located, contributes 70% of the total enrolled students (see Table 5; School Report Card, 1996). Both communities are predominately white, affluent, and residential. The average home is valued at $475,000 in the larger town and $303,977 in the smaller town. Feeder schools to Site B include two public K-8 schools, a private K-8 parochial school, and a private K-9 school. Teachers from all schools regularly meet to share curricula within each content area.

Table 5

1990 Census Information on the Communities Served by Site A and Site B

Site and Community	Individuals	Families	Percent Caucasian	Median Family Income
Site A				
1	30,575	8,845	94%	$71,905
2	5,331	1,282	85.4%	$38,662
Site B				
1	17,836	4,742	96%	$127,356
2	5,513	1,640	98%	$114,523

Within Site A, approximately 11% of the households with one or more children under 18 years of age are single-parent households (U.S. Gazetteer, 1997). Similarly, most of Site B's students come from two-parent households; approximately 7% of the households with one or more children under 18 years of age are single-parent households (U.S. Gazetteer, 1997).

Both school districts have tremendous parental support. Roughly 95% of the school families belong to the parent-teacher associations. These organizations facilitate communication between home and school, initiate enrichment programs, and are active fund raisers for school activities. At Site A, a seven member board directs district-wide operations and programs. One district philosophy includes the implementation of site-based management. The board believes that this approach, in which parents, administration, and staff work together, best achieves district-wide educational goals. Site B is also directed by a seven member Board of Education. The board members host monthly lunch meeting with the faculty and participate in a joint committee with faculty and administrators in order to facilitate communication.

Site A recently passed a 40 million dollar referendum bond issue for infrastructure repairs, school additions, safety programs, and technology upgrades throughout the district. Another community issue involved a district-wide task force to plan and implement changes in attendance areas for district students. The aim of this plan was to balance the numbers and diversity of the student populations at the neighborhood schools.

At site B, a 24.6 million dollar bond issue was recently approved for expansion of the facility. In addition, the school received a technology grant for staff development, additional equipment, and membership in a community based Internet consortium. The district has requested permission for physical education waivers from the state. This has stirred much debate among the administration, faculty, and members of the community.

National Context of the Problem

Gender bias can be defined as creating barriers or adhering to stereotypes that limit the opportunities and choices of both boys and girls (Bailey, 1996). Perhaps the most socially acceptable form of discrimination, gender bias permeates our schools and society. Within a school

setting, gender bias can be as direct as excluding, isolating, or stereotyping instructional materials on girls and women; or as subtle as tokenism, condescension, or maintenance of a double standard (Wellesley College Center for Research on Women, 1992). Although this discussion focuses primarily on gender bias against girls, boys also labor under restrictive cultural stereotypes that deny their emotional lives and create intense pressure to succeed. Both boys and girls are victims of gender bias.

The issue of gender equity in the classroom has come to the forefront of national attention since the landmark study commissioned by the American Association of University Women Educational Foundation. The study, "How Schools Shortchange Girls," published in 1992, documented systematic bias against girls beginning with their preschool experiences, and continuing throughout their formal education (Wellesley College Center for Research on Women, 1992). One of the goals of the report was to bring the issue of gender equity to the attention of educational policy makers and to provide strategies for educators to ensure equal educational opportunities for all children.

Another goal of the report was to show that educational inequity has social and economic ramifications (Wellesley College Center for Research on Women, 1992):

> The implications of the report's findings are enormous. Women and children are swelling the ranks of the poor at great cost to society. Yet education policy makers are failing to address the relationship between education and the cycle of poverty. The shortchanging of girls is ignored in the current educational restructuring debate. (p. v)

The connection between economic well-being and the empowerment of women is clear. Gender equity "is central to a higher quality of life for the country as a whole" (Eisler, Loye, & Norgaard, 1995, p. 80). Unfortunately, of 174 countries surveyed by the United Nations Development Programme (including the United States), none were found in which women were treated as well as men (Schorr, 1996).

The problem of gender equity is widespread. Ways in which girls are being treated unequally begin with social expectations and gender roles. Traditionally, girls are expected to behave in ways

different from boys (Bailey, 1996). For example, girls are discouraged from being assertive in their peer interactions and in the classroom setting. Girls are often reprimanded for calling out in the classroom, behavior that is considered acceptable and even desirable in boys (personal observation; Sadker & Sadker, 1994). At the same time, girls are rewarded for being quiet and well-behaved, while not being equally challenged academically. "Teachers praise boys more for the intellectual content and quality of their work, and praise girls more for neatness and form" (Ambrose, 1996, p. 73). As a result, girls are not getting the same quantity or quality of education that boys are receiving.

Evidence also exists that girls are being discouraged from taking demanding math, science, and technology courses (Lightbody, Siann, Stocks, & Walsh, 1996; Wellesley College Center for Research on Women, 1992). These courses are needed for productive participation in a competitive work force. However, career choices are not always based on ability and qualifications, but are influenced by traditional gender roles. "Even girls who take the same math and science courses and do just as well on standardized tests are far less likely to consider technological careers" (Ostling & Urquhart, 1992, p. 62).

Those women who do embark on scientific careers face further obstacles. A study of highly trained men and women scientists found that among the women, "the average academic status was almost one full rank below the men's" (Sonnert, 1995, p. 54). Female scientists often feel excluded or marginalized in the work place. One woman, in struggling to overcome her lack of self-esteem, stated that "the barriers to me were all internal, my sense of not belonging, my sense of anxiety at failure" (Sonnert, 1995, p. 56).

Gender bias in school initiates this drop in self-esteem. As girls go through school, they are given the message that their interests have less importance than those of boys, a message that is reinforced in many ways. For example, traditional science and health books feature males in illustrations far more frequently than females. Books that children read in literature classes are most often written by men (Wellesley College Center for Research on Women, 1992) and usually have male protagonists (Sadker & Sadker, 1994). The accomplishments of women are largely

excluded from social studies curricula. Most high school students are unable to name more than a few famous female historical figures (Sadker & Sadker, 1994).

Teachers often unintentionally undermine girls' self-esteem by devoting more time and attention to boys (Wellesley College Center for Research on Women, 1992). Because boys monopolize the teacher's attention, girls may feel that their contributions are devalued. Whereas boys may receive constructive criticism of their comments, girls often receive generic praise such as "good" or "that's nice."

> The differences in teacher evaluations of male and female students have been cited by some researchers as a cause of "learned helplessness,"or lack of academic perseverance, in females. Initially investigated in animal experiments, "learned helplessness" refers to a lack of perseverance, a debilitating loss of self-confidence. (Wellesley College Center for Research on Women, 1992, p. 69)

Girls' self-esteem may also be negatively affected by degrading or negative comments made by their male peers. When girls are teased for making intelligent remarks, their participation level in class drops (Wellesley College Center for Research on Women, 1992). Many girls have creative strategies for avoiding classroom participation (Sadker & Sadker, 1994). These include sitting where teachers are less likely to call on them and raising their hand tentatively to give the appearance of participation. Teachers may inadvertently contribute to the lack of participation by not providing wait-time for girls. "Teachers talk to boys more, ask them more questions, wait longer for them to answer, and give them more praise" (Ambrose, 1996, p. 73).

Tests, both standardized and teacher-made, are an important source of gender bias in schools. Standardized testing has a long history of bias. In fact, the Scholastic Aptitude Test (SAT) was originally designed after World War I for the purposes of excluding immigrants from attending eastern universities (Sadker & Sadker, 1994). Although today's bias is not so evident, it nonetheless exists. Research has demonstrated that while men and women may receive the same grade in equivalent college courses, the women scored significantly lower (30 to 40 points) on the SAT. Conversely, in cases where men and women scored equally on the SAT, the women had

higher course grades than the men (Sadker & Sadker, 1994; Wellesley College Center for Research on Women, 1992). The SAT is used by colleges and universities to estimate qualifications of applicants and predict their success in college-level courses. What is at stake is not only admission, but scholarship money. Contrary to its intended purpose, the SAT is not a fair indicator of aptitude, and women are paying the price (Sadker & Sadker, 1994; Wellesley College Center for Research on Women, 1992).

Bias in tests can also take the form of unequal or stereotypical representation of males and females. Studies have documented that tests over represent males and "typical" male activities.

> A later study of the SAT found references to forty-two men and only three women in the reading comprehension passages used in the four 1984-85 exams. Of the forty-two men, thirty-four were famous and their work was cited; one of the three women was famous (Margaret Mead) and her work was criticized. (Wellesley College Center for Research on Women, 1992, p. 53)

Bias can also exist in the types of test questions; males traditionally perform better on objective questions and females perform better on open-ended questions and essays. Some evidence exists that boys do better at questions involving analogies, while girls do better at questions involving antonyms (Wellesley College Center for Research on Women, 1992).

The issue of gender bias is a complex and controversial one. Although no one is likely to advocate gender bias in the classroom, there are some who deny or downplay its existence. Those who attack efforts to eliminate bias often state that the education of boys will suffer as a result. Some believe that teachers are only concerned about bias when girls are the victims. "If boys are deficient in the language arts, that's just too bad for them" (Byfield, 1995, p. 52). However, the belief that boys are "deficient" at English and reading is not supported by the literature (Lummis & Stevenson, 1990; Sadker & Sadker, 1994). Another belief is that bias simply cannot exist if most of the teaching staff is female (Byfield, 1995). But being female in no way prevents a teacher from subtly reinforcing stereotypical gender roles, roles that she may adhere to herself.

The landmark AAUW report was dismissed as "just pleading and, frankly, whining" by

Assistant Secretary of Education, Diane Ravitch (Ostling & Urquhart,1992, p. 62). However, the AAUW report painstakingly documented how gender bias permeates our schools and society. The evidence simply cannot be ignored. As one researcher said, "the notion that helping girls means hurting boys amounts to a defense of a status quo that we all know is serving too few of our students well" (Bailey, 1996, p. 75). It is the role of educators to first locate sources of gender bias in their own classrooms, and then take the necessary steps to eliminate it.

CHAPTER 2

PROBLEM DOCUMENTATION

Problem Evidence

In gathering problem evidence related to gender bias at Sites A and B, three areas of bias were examined. These included gender bias in the classroom, gender bias in instructional materials, and gender inequities in course enrollment.

Gender Bias in the Classroom

In terms of participating in the classroom, boys ask and answer more questions than girls (Hannan, 1995; Ostling & Urquhart, 1992; Wellesley College Center for Research on Women, 1992). Boys tend to dominate classrooms discussions, make more declarative statements, and interrupt in a group setting (anecdotal records; Hannan, 1995; Wellesley College Center for Research on Women). In addition, misbehavior by boys serves to monopolize teacher time and attention. Checklists of student behavior at Site A and B supported these observations (Table 6).

Table 6

Differences in Classroom Behavior by Gender at Sites A and B.

Gender	Declarative Statements	Teacher Time and Attention	Misbehavior
Male	74%	70%	76%
Females	26%	30%	24%

Behavior of students in sites A and B was documented through the use of behavior checklists and audiotape analyses. Of the 76 incidents of recorded declarative statements, boys

made almost three times as many as girls. Declarative statements included unsolicited questions or comments. Teacher interaction was documented using a participation tally sheet. At ten minute intervals, the teacher recorded the gender of the student with whom she was interacting. Results showed that the teacher had twice as much interaction with boys than with girls. Table 6 also documents misbehavior by gender. A behavioral anecdotal checklist was used to record misbehavior, which was defined as disruptive, off-task, or non-participative behavior. Of 140 recorded incidents, boys exhibited misbehavior three times as often as girls.

Boys tend to intimidate girls into lower levels of participation (anecdotal records; Ostling & Urquhart, 1992; site survey). At site A, of 35 recorded incidents of put-downs, 66% were made by males. A student attitudes survey was conducted in which students were asked who (boys or girls) was more likely to make fun of other students' verbal answers. Both males and females responded that boys are more likely to be verbally intimidating (Figure 1).

Belief of who was more likely to be victims of verbal intimidation differed by gender. Fifty-four percent of male students felt that boys were more likely to be made fun of while 39% of girls believed that they were more likely to be the target of intimidation. Among all students, 42% believed that intimidation was not gender-specific.

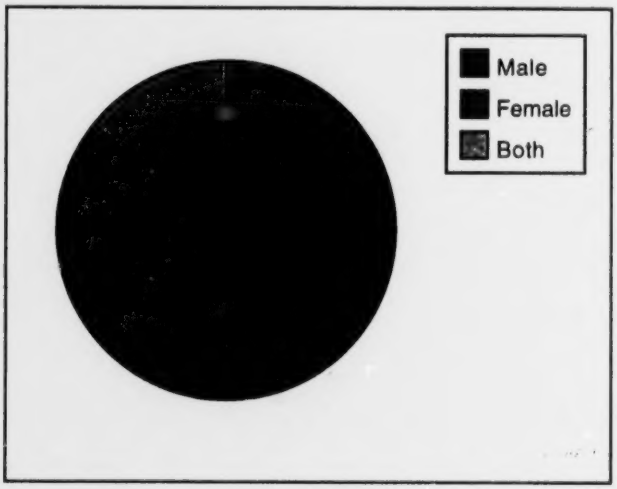

Figure 1. Student Perception of Intimidating Behavior by Males and Females.

Anecdotal records revealed some other notable differences in behaviors. When given the opportunity to choose their own seats or partners, students overwhelmingly segregated themselves by gender. At Site A, all students chose to sit in same-sex groups. Students were asked to choose a partner to share shelf space, and of 30 students, all but 4 chose to share a shelf with a person of the same gender. Students at Site B, likewise segregated themselves by gender when forming lab groups. Of 12 tables, only 3 were of mixed-gender.

Traditional gender roles were reflected in self-assigned tasks during group work in both Sites A and B. In a total of 51 cooperative groups, girls chose the role of illustrator or recorder 75% of the time. On occasion, when the role of group recorder was assigned to a boy by the teacher, these boys were observed pressuring girls to take on the role.

The results of the documentation of student behavior in Sites A and B revealed the following key trends: the boys attempted to monopolize the teacher's time and attention by misbehaving, the boys were found to be more verbally intimidating, students tended to segregate themselves by gender, and students often took on stereotypical gender roles during group work. These behaviors all seem to contribute to lower participation levels of the girls in Sites A and B. Similar results in terms of evidence of the existence of gender bias were also found in instructional materials.

Gender Bias in Instructional Materials

Gender bias is evident in the choice of instructional materials in the classroom (Wellesley College Center for Research on Women, 1992). For example, in the freshman College Preparatory English classes at Site B, seven books written by men and none by females were read. Of these books, only Romeo and Juliet featured a female protagonist. Of the 15 books studied at Site A, 7 featured a male protagonist, while only 4 featured a female protagonist. In the remaining four novels, the protagonists were both females and males.

English teachers often assume that boys will complain about reading books featuring female protagonists, whereas girls do not mind reading books with male protagonists (anecdotal records). Therefore, in an effort to motivate students, books with male protagonists are most

frequently chosen. Unfortunately, this practice may serve to undermine girls' self-esteem (Ostling & Urqhart, 1992). "Lowered self-esteem is a perfectly reasonable conclusion if one has been subtly instructed that what people like oneself have done in the world has not been important and is not worth studying" (Wellesley College for Research on Women, 1992, p. 67).

An analysis of the health textbook at Site A and the biology textbook at Site B revealed that the textbook publishers and authors have made efforts in eliminating gender bias. However, some interesting differences in depicting genders were noted. For example, the health textbook featured 20 diagrams of the human body systems. Of these 20 diagrams, 14 depicted males and only 6 depicted females. In the four diagrams where both male and female figures were featured, the male figure was shown first in three of these diagrams. In the biology textbook, diagrams of male bodies were depicted 17 times; all of these were shown in gender-neutral settings. However, only nine diagrams of females were shown (three depicting childbirth and the female reproductive system). Not included in the male diagram total was the use of a boy's head 46 times to highlight a "critical thinking" section found in each chapter.

One striking gender difference in both the health and the biology textbooks was the number of males and females depicted in traditional and nontraditional roles. In the biology text, there were 21 diagrams and photographs of women in traditional roles. These included women with food, mothers and their children, nurses, and women giving birth. Males, however, were depicted 45 times in traditional roles (as scientists, doctors, firemen, farmers, etc). Furthermore, only four males were shown in nontraditional settings. Two of these pictures showed men with their children (whereas there were six pictures of women with children). A total of 22 women were shown in non-traditional roles, almost all of them being scientists in laboratories.

The health text analysis revealed similar findings. Women were portrayed 32 times in traditional roles such as mothers, teachers, and nurses. In contrast, men were depicted in traditional roles 79 times. The majority of these photos pictured male athletes. Females were shown in nontraditional roles 43 times. Several of these photos depicted females pursuing traditionally male-dominated careers, including law enforcement, medicine, and law. On the other

hand, only 11 males were portrayed in nontraditional roles. Many of these photos featured males shopping, cooking and serving food. In short, it appeared that where great efforts were made to include women in nontraditional roles, few efforts were made to show men in nontraditional roles. As was noted earlier, gender bias affects both boys and girls.

Further analysis of the textbooks revealed some subtle examples of gender inequities. In the biology text, 15 famous men were depicted; all but 1 was a famous scientist. Only 6 famous women were shown, including Karen Carpenter whose eating disorder was discussed. The other pictures of women in non-traditional roles were mostly on unnamed women in laboratories. In the health textbook, a "Teens Making a Difference" section appeared in each chapter. Of the 18 sections, 10 depicted female teens, 4 depicted both male and female teens, while only 4 depicted male teenagers. However, many of the female and male teens were portrayed in traditional roles. The females were depicted in nurturing roles such as teacher assistants and babysitters, while the males were shown repairing bicycles, leading discussion groups, and as lead singers in a rap group. Although gender bias in the textbooks most recently published is more subtle than in the past, the analysis revealed that it still exists. Evidence of gender inequities in course enrollment also was found, upon examination of course enrollment figures at Site B.

Gender Inequities in Course Enrollment

Enrollment in upper level science courses reflects gender inequities at Site B (see Table 7). There were almost twice as many boys enrolled in Advanced Placement chemistry and physics. Only AP biology showed roughly equal numbers. Of the 20 students taking Advanced Placement physics tests in the past two years, only 1 was female. These differences in enrollment could be attributed to attitudes of females toward the chemistry and physics instructors (both of whom are male). However, these numbers reflect current trends; girls are entering the biological sciences, but still shying away from the analytical physical sciences (Honey & Bennett, 1994; Lightbody et al., 1996; Wellesley College Center for Research on Women, 1992).

In summary, the results of the data collection identified evidence of the existence of the following problem areas. Clear differences in classroom behavior by gender were found. Subtle

gender bias in classroom materials still exists. Finally, an analysis of course enrollment figures reflects gender inequities in advanced science classes. Before effective solutions can be proposed, it is important to examine probable causes for the observed gender inequities.

Table 7

Site B Enrollment by Gender in Advanced Placement Courses for the 1996-97 school year.

Gender	AP Biology	AP Chemistry	AP Physics B	AP Physics C
Girls	11	6	9	3
Boys	14	11	15	7

Probable Causes

In this section, the probable causes of gender bias will be identified and discussed. Gender bias begins with the development of gender roles at a very early age, and is reinforced in the classroom through peer interactions and teacher expectations.

The Development of Gender Roles

The roots of gender bias in the classroom originate with the development of gender roles at very early ages. As children develop, they learn from their parents, peers, teachers, from television, and other environmental influences (Bailey, 1996; Best, 1983); they learn what is expected of them, and for the most part, they strive to meet those expectations (Cowher, 1995). Girls are expected to be pretty and well-behaved; boys are expected to be boisterous and adventurous. Children receive these contrasting messages in innumerable ways. For example, girls receive more praise than boys for their good behavior and appearances (Thorne, 1993; Wellesley College Center for Research on Women, 1992), thereby learning that their appearance is critical to their social acceptance. Girls are bombarded with media imagery portraying beautiful, thin, young women and feel pressure to look this way. Because this stereotyped image of beauty is impossible to attain, girls' feelings of self-worth become jeopardized. "Women's identity must be premised upon our 'beauty' so that we will remain vulnerable to outside approval, carrying the

vital sensitive organ of self-esteem exposed to the air" (Wolf, 1991, p. 14). Not surprisingly, there is an epidemic of eating disorders among girls in the United States (Wellesley College Center for Research on Women, 1992).

Young girls are often given the message that beauty and brains do not go together, and this stereotype translates into anxiety about being perceived as too intelligent at school. "Culture stereotypes women to fit the myth by flattening the feminine into beauty-without-intelligence or intelligence-without-beauty; women are allowed a mind or a body but not both" (Wolf, 1991, p. 59). Raphaela Best, a researcher observing schoolchildren, witnesses one girl teasing another for showing pride in her accomplishments. "Self-congratulation about achievement was acceptable in the boys' world, but, apparently, not in the girls'" (p. 93). These behavior expectations often follow girls into the classroom setting.

Gender Bias in the Classroom

One way girls may avoid appearing "too smart" is to not participate in classroom discussions. More girls reported feelings of anxiety about participating in discussions than did boys (anecdotal records). In addition, more girls reported fears about teasing from classmates because of their participation (Student Attitudes Survey). At Site A, for example, there were several incidents in which boys teased girls for participating. This resulted in diminished participation by these girls (anecdotal records). At Site B, this problem was the focus of an editorial in the school newspaper.

> Rude remarks and teasing have resulted from questions I asked. At first I just ignored the laughter at the back of the room, but now it has progressed to the point where I can either ask a question and hear jokes about it for weeks, or stay silent and lose a valuable part of my education. (Coates, 1997, p. 4)

Research supports the existence of helpless behavior in girls (Dweck, Davidson, Nelson, & Enna, 1978; Hannan, 1995), and highlights the difference in the attitudes of boys. Fairy tales featuring damsels in distress; Disney heroines being rescued by handsome princes; movies, TV, video and computer games portraying females victimized or rescued by men; these are some of

the helpless female role models to which young girls are exposed. Girls socialized by these role models learn to value dependence and helplessness, to see these attributes as being feminine. In school, girls often refer to themselves as "dumb," "not good at science," or as not being able to "get it" (anecdotal records). On the other hand, boys exhibit more confidence in their intellectual abilities than do girls (Cowher, 1995).

Teachers contribute to the learned helplessness of girls by blaming their academic failure more on the lack of ability and intellectual deficiencies than lack of motivation. For boys, the situation is just the opposite; teachers will most often explain failure to boys in terms of not trying hard enough. Consequently, girls "attribute their failures to lack of ability rather than motivation and thus show impaired performance under failure" (Dweck et al., 1978, p. 268). This can lead to girls being less persistent in problem-solving activities.

Girls are more likely to have a task completed by the teacher than boys (Hannan, 1995). A teacher may quickly finish a task for a student in order to save the time and frustration of trying to explain a difficult process; but when this happens, the teacher cheats the student out of a learning experience (anecdotal records). In addition, the teacher's behavior reinforces the "learned helplessness" stereotype of female students, and sends the message that a girl's gain of knowledge is not very important.

The importance of girls can also be undermined by unequal enforcement of school rules. Sometimes teachers will let girls get away with misbehavior while punishing the boys. The following example, witnessed by Raphaela Best (1983), illustrates this point:

> Taking Elizabeth by the hand, the teacher led her to the office, where she explained that Elizabeth was a "good girl" and that she had not meant to disobey school rules. She asked that Elizabeth be excused from sitting on the bench and having to explain to the principal what she had done. Still holding Elizabeth by the hand, she led the smiling girl back to the classroom, while Denver was left on the bench to await his fate with the principal. The lesson was indirect but clear: girls, being weak, could expect mercy; boys were strong enough for justice. (p. 61)

An important source of gender bias in the classroom is the type of feedback that teachers give students. Patterns of praise and criticism are different for girls and boys (Berliner & Casanova, 1993; Hannan, 1995; Wellesley College Center for Research on Women, 1992). "Several studies have found that boys are more often scolded for misbehavior and praised for their academic work, while girls are more often chastised for poor academic performance and praised for appearance, neatness, and being polite" (Thorne, 1993, p. 182). Thus, the behaviors that are being reinforced are different for boys and girls and as a result, boys have greater pride in their academic achievement.

The problem of gender bias begins with gender roles and social expectations. Evidence that this problem also exists in the classroom has been thoroughly documented. In order to ensure equal educational opportunities for all children, effective strategies must be provided to educators and then be implemented by classroom teachers.

CHAPTER 3

THE SOLUTION STRATEGY

Literature Review

As a society, it is important to recognize that there is a relationship between the standard of living of a country and the empowerment of its women. Cultural historian Riane Eisler "makes a clear and convincing case that the status of women is a barometer of the health of a society" (as cited in Schorr, 1996, p. 18). When addressing gender equity issues, a society needs to take steps "to ensure that gender equity keeps pace with economic growth" (Schorr, 1996, p. 18). Countries that treat women well are more likely to gain economically. A study conducted by cultural historian Riane Eisler "attempts to demonstrate that if a country treats its women equitably it's likely to score high on quality-of-life measures, such as life expectancy, wealth and human rights" (as cited in Schorr, 1996, p. 18).

In this chapter, gender bias in the home, classroom, and curriculum will be addressed. In addition, several non-biased teaching strategies will be discussed and an overview of the action research objectives and plan will be outlined.

Addressing Gender Bias at Home

It is important for families to address gender bias issues at home. Because girls lack female role models for balancing work and family (Cowher, 1995), parents should introduce their daughters to a wide variety of professional women (Kyrene School District's Gender Equity Web-Site, 1997; McDaniel, 1994). Girls need to know that it is possible to have both a fulfilling career and a family. Parents should discuss career plans with their daughters as early as the middle school years (Kyrene School District's Gender Equity Web-Site, 1997) in order to ensure that

their daughters enroll in the course work necessary to pursue their chosen field of study. "If your daughter is interested in how things work, consider buying her a subscription to a computer magazine or Popular Mechanics. Staying tuned into the education of your daughter may be the most important recommendation" (Bullock, 1996, p. 67).

In the home, parents should assign chores to girls and boys on a nonsexist basis. In order to model gender equity at home, parents should share child care and household duties equally. Parents also need to ensure that siblings treat each other equitably. Another important role of parents is to monitor television programs for sexist stereotypes and encourage discussions related to gender bias in the media (McDaniel, 1994). Ideas should be shared freely with both daughters and sons (Kyrene School District's Gender Equity Web-Site, 1997; McDaniel, 1994).

Encouragement in a subject may actually lead to greater enjoyment and participation in that subject (Lummis & Stevenson, 1990). Therefore, it is essential that parents value and encourage their childrens' academic pursuits. Parents should encourage girls to take math and science courses as well as promote an interest in math and science outside of school (McDaniel, 1994). It is also important that parents value their daughters' accomplishments, ensure they are participating actively in school (Kyrene School District's Gender Equity Web-Site, 1997), and urge them to take risks (Bullock, 1996).

Parents who offer encouragement to their daughters and hold high expectations for their sons and daughters create a gender-equitable climate at home. Unfortunately, their children may still encounter gender bias in the classroom.

Addressing Gender Bias Within the Classroom

In order for progress in gender equity to be made, the existence of gender bias must first be acknowledged in both the school system and within classrooms (Bailey, 1996). Because gender bias is deeply ingrained in our culture and often socially acceptable, acknowledgment can be a difficult first step (Ambrose, 1996). The following example illustrates gender bias in a typical classroom that often goes unnoticed. It highlights how adult supervision can affect gender separation.

> Miss Bailey let her fourth-fifth-grade students choose their classroom seats and then legitimated the almost total division between boys and girls by joining in talk about a boys' side and a girls' side and by organizing boys against the girls for math and spelling contests. But when she organized reading groups, she used her authority to draw girls and boys together, thereby lessening the salience of gender. (Thorne, 1993, p. 55)

Teachers must recognize the existence of their own gender biased behavior, and not let their "stereotypic assumptions" guide their teaching practices (Bailey, 1996, p. 79). Often the most well-intentioned teachers are not aware of treating girls and boys differently. One way for a teacher to determine if gender bias exists in their classroom is to have an observer code teacher-student interactions. The observer could record each time a student speaks in class, note the student's gender, then categorize the teacher's response into one of four categories: praise, criticism, remediation, or acceptance (Sadker & Sadker, 1994). The teacher could use this information to look for differential treatment of students.

Bias may be as subtle as body language. "Nonverbal behaviors can signal inclusion or exclusion, indicate interest and attention (or the opposite); communicate success or failure and foster or impede students confidence in their own abilities. . ." (Yepez, 1994, p. 132). For example, in one classroom which had boys and girls sitting on opposite sides of the room, the teacher's gender bias was unintentional.

> After giving the math book to a girl to hold open at the page of examples, the teacher turned her back to the girls and focused on the boys, teaching them actively and directly. Occasionally she turned to the girls' side, but only to read the examples in the book. This teacher, although aware that she was being observed for sexism, had unwittingly transformed the girls into passive spectators, an audience for the boys. (Sadker & Sadker, 1994, p. 3)

The report commissioned by the AAUW in 1992 indicated the need for more staff development and training related to gender equity. By attending gender equity training workshops, teachers can learn how to detect and then correct bias in their language, in the books

and materials used, and in the way they interact with children (Ambrose, 1996; Schrof, 1993). The AAUW went as far as to suggest that state certification boards require student teachers to study gender equity as part of their teacher training.

Teachers must objectively examine their own behaviors and classroom management structures in order to first recognize the existence of gender bias, and then take steps to eliminate it. In addition, teachers also need to heighten their awareness of bias that exists within the school's curriculum.

Addressing Gender Bias in the Curriculum

A gender-fair curriculum acknowledges variation among students, fairly represents accomplishments of both genders, broadens opportunities and choices for all students, and is integrated (Bailey, 1996; Wellesley College Center for Research on Women, 1992). According to the Carnegie report of 1989 entitled "Turning Points: Preparing American Youth for the 21st century," schools can begin to eliminate gender bias by creating a safe and reinforcing environment for all students in which reflection and self-evaluation activities are encouraged (McKnight-Taylor, 1994; Pollina, 1990).

An inclusive curriculum is sensitive to different learning styles, addresses multiple intelligences, and fosters cognitive and affective skills in both girls and boys (Ochman,1996). This type of curriculum will "help both girls and boys learn the competitive and relational skills necessary for meaningful participation in the work force, family and community" (Wellesley College Center for Research on Women, 1992, p. 2).

The school curriculum can be enriched by developing mentoring programs in which female science and technology professionals work with high school students. This type of program teaches scientific principles in a social context and "may help girls gain a voice and find their place in science and technology" (Honey & Bennett, 1994, p. 16).

One way to enhance gender equity in schools is to use non-biased curriculum materials (Cowher, 1995). Books and other materials should fairly represent both strong male and female role models. Research has shown that girls' self-esteem is enhanced when female protagonists are

portrayed in a strong, positive light. "For example, discovering that girls' self-concept is enhanced through exposure to a strong female character has serious implications for many 'traditional' practices that are continued through the years, often without question. Primarily the practices of utilizing male-dominated written materials in schools should be seriously reassessed and revised" (Ochman, 1996, p. 731). Tests and assessment tools should use non-biased language and avoid stereotyped representations. Authentic assessment involving real-life applications and problem-solving should be used in balance with traditional methods (Wellesley College Center for Research on Women, 1992).

A gender-fair curriculum in which multiple intelligences are addressed, girls are encouraged and given appropriate guidance, and curricular materials are free of bias is an ideal for which all schools should strive. Individual teachers may adopt many effective strategies which also aid in creating an equitable school climate.

Non-biased Teaching Strategies

In order to address gender equity issues, teachers should incorporate effective non-biased teaching strategies into the classroom. Teachers can model non-biased behaviors, thereby positively affecting student behavior (Cowher, 1995; Cronin & Sawsan, 1995). In a study of high school students, it was found that modeling non-sexist language resulted in more usage of non-sexist language. Non-sexist language is important because language influences thought development. Research has shown that language usage is related to attitudes towards women (Cronin & Sawsan, 1995).

Teachers must maintain high expectations for both girls and boys. The level of the teacher's expectations is communicated to students in many ways. Waiting at least five seconds after asking a question not only allows students to formulate a more thoughtful answer, but encourages greater participation by all students (Merenbloom, 1992). Teachers should avoid calling on the first student to raise their hand; instead they should use an alternative method of randomly calling on students. Thus, students will know that the teacher holds high expectations for all.

Teacher feedback transmits expectations as well; however, the type of feedback that students receive differs by gender. Simply stated, boys are praised for intellectual adequacy and criticized for lack of effort, whereas girls are praised for effort, and criticized for intellectual inadequacy (Dweck et al., 1978; Sadker & Sadker, 1994; Wellesley College Center for Research on Women, 1992). Teachers typically assume girls put forth a great deal of effort, and so they may attribute errors to inability to comprehend the material. Conversely, teachers have lower expectations for effort among boys. Because teacher praise transmits expectations, it is imperative that teachers praise both girls and boys for their academic accomplishments, and expect the same high level of effort from all students.

Teaching strategies should address differences in learning styles of girls and boys. In the traditional classroom, the predominate use of a lecture format is in sharp contrast to the learning styles of girls. During lecture, most teachers believe they call on girls and boys equally. However, studies show that on average, teachers call on boys to answer questions three times as often as they call on girls (McDaniel, 1989; Wellesley College Center for Research on Women, 1992). "Traditional education is directed towards and appeals more to males since it is primarily abstract and reflective. Females learn better in hands-on and practical settings, emphasizing the realm of the affective and doing" (Philbin, 1995, p. 491). Other studies have emphasized the importance of offering hands-on activities that engage girls in solving real-life problems (Chandler, 1994; McDaniel, 1994; Pollina, 1990; Sadker & Sadker, 1994; Wellesley College Center for Research on Women, 1992). Following a hands-on activity, all students benefit from a whole-class discussion. Studies have shown that by providing the experience first, all students have an equal knowledge base to draw upon for class discussion (Wellesley College Center for Research on Women, 1992).

Placing students in cooperative groups can be an effective strategy to increase student participation and develop problem-solving and social skills. Research has shown that girls benefit from this type of learning structure because of its non-competitive nature. Evidence suggests that girls are more cooperative (Berliner & Casanova, 1993; Kline, 1995; Ostling & Urquhart, 1992;

site checklist) and place a higher priority on "concern for others" (Philbin, 1995, p. 491). Even though the use of cooperative groups has many benefits, there are some pitfalls that teachers need to be aware of and take steps to prevent. Ineffective use of cooperative groups may actually reinforce stereotyped gender roles. For example, some boys may dominate group discussions, while others may show their social dominance by ignoring the girls in a group. Girls, on the other hand, may shy away from leadership roles; be viewed as followers; and assume passive roles, such as that of a recorder (Wellesley College Center for Research on Women, 1992).

Some suggestions for creating cooperative groups include forming small mixed-gender groups, emphasizing the importance of cooperation (Thorne, 1993), and rotating assigned roles. In addition, teachers should place less emphasis on competition between groups and speed (Bailey, 1996).

Left alone, girls and boys tend to group together by gender on opposite sides of the classroom (anecdotal records; Yepez, 1994). It is important for teachers to form seating arrangements that increase male and female interaction. One researcher noted that the students recognized the benefits of these seating charts.

> When adults form mixed-gender groups, I have observed that some kids look a little relieved; the adult action takes away the risk of teasing and makes girl-boy interactions possible. "That's the advantage of assigned seating," one boy told me; "you get to talk to kids you usually wouldn't get to know." (Thorne, 1993, p. 163)

Assigned seating has an additional benefit of increasing female student-teacher interaction. Research has shown that teachers will talk to boys regardless of where they are sitting in the classroom, but that they will talk to girls when they are seated nearby (Yepez, 1994).

Figure 2 outlines additional strategies aimed at eliminating gender bias in the classroom. This list was developed from a variety of sources (Chandler, 1994; Flynn, 1994; Kyrene School District's Gender Equity Web Site, 1997; McDaniel, 1994; Thorne, 1993). These classroom strategies, while designed to increase participation in girls, directly benefit boys as well. "Gender

equity is about enriching classrooms, widening opportunities, and expanding choices for all students" (Bailey, 1996, p. 75).

Strategies for Eliminating Gender Bias in the Classroom

- Address whole-group as "class" or "students"--avoid saying "boys and girls"
- Videotape yourself to find out how you interact with girls and boys.
- Call students by name -- set clear rules about calling-out.
- Integrate classroom tasks (don't have the girls do all the "housekeeping" jobs)
- Point out stereotyping in instructional materials. Have students report instances of this.
- Provide role models in classroom displays.
- Invite guest speakers with non-traditional roles.
- Talk about gender concerns.
- Choose texts and other materials with non-traditional roles for men and women.
- Balance requests for assistance.
- Make tests and quizzes gender neutral
- Encourage nontraditional physical activities (girls=football, boys=gymnastics)
- Design co-ed career development classes
- Help girls set long-term goals
- Challenge girls to defend their answers
- Provide equal opportunity for girls to answer questions and lead class discussions
- Have students design criteria for assignments
- Use rubrics
- Promote student self-evaluation

Figure 2. Strategies for Eliminating Gender Bias in the Classroom

Awareness of the problem of gender bias is a first step toward eradicating it from the home and classroom. Parents and teachers need to analyze their own underlying expectations of gender roles and how these expectations may lead to gender inequities. Teachers can increase certain teaching practices which foster equal learning and participation by girls and boys. In the next section, the action research objectives and plan will be presented. The project action plan incorporates many of the non-biased teaching strategies previously discussed.

Project Objectives

As a result of increased efforts to equally involve girls and boys in classroom participation, the targeted eighth grade health students and ninth and tenth grade biology students will demonstrate fewer gender differences in participation, and will show an increase in the number of positive interactions between girls and boys during the period of September, 1997 to January, 1998. The changes in student participation and interactions will be measured by behavioral checklists and student attitude surveys.

Process Statements

In order to accomplish the above objectives, the following processes are necessary:

1. Development and implementation of tools and procedures that ensure equal participation by girls and boys.
2. Development of activities that encourage increased participation by girls.
3. Fostering of cooperation and participation in group activities by forming cooperative groups with equal representation by gender.

Project Action Plan

I. Develop and implement tools and procedures that ensure equal participation by girls and boys.

A. Administer a student attitudes survey during the first week of school in order to provide an outlet for student expression and to provide baseline data.

B. Design a heterogeneous seating arrangement in order to encourage interaction between girls and boys. Implement during the second week of school after baseline data is collected. Repeat this process every six weeks in Site A with a new group of students.

Maintain this arrangement in Site B for the duration of the study.

C. Develop a set of name cards to be used for random questioning on a daily basis during class discussion and review sessions in order to encourage equitable participation.

D. Use participation tally sheets, behavior checklists, and audiotape records during whole class instruction and/or cooperative group activities on a weekly basis.

E. Examine tests and supplementary materials for gender bias and make appropriate changes before providing these materials to students in order to eliminate bias.

II. Develop activities that encourage increased participation by girls.

A. Provide "hands-on" opportunities on a weekly basis in order to increase participation by girls.

B. Design at least three new cooperative group activities during the course of the study in order to promote equitable participation.

C. Incorporate real-life situations during role-play, debate, discussion or test questions on a weekly basis in order to reflect the experiences of both girls and boys.

D. Use rubrics for project assessment at least three times during the course of the study in order to provide self- and teacher-feedback.

E. Hold weekly classroom discussions following small and large group activities in order to provide students with similar experiences from which to form and share opinions.

F. De-emphasize competition and speed during cooperative group activities in order to increase participation by girls.

III. Foster cooperation and participation in group activities by forming cooperative groups with equal representation by gender.

A. Establish mixed gender base groups during the second week of school in order to encourage students to learn about and from each other. Repeat this process every six weeks in Site A with a new group of students.

B. Target participation and cooperation as social skills during cooperative group activities in order to increase the use of these skills by the students.

C. Establish procedures to rotate role assignments during the second week of school in order to avoid stereotyping in role assignments. Repeat this process every six weeks in Site A with a new group of students.

D. Create the role of student-observer during the second week of school in order to monitor student participation in cooperative group work. Repeat this process every six weeks in Site A with a new group of students.

E. Provide for group processing of targeted social skills following each cooperative group activity to encourage self-assessment and metacognitive development.

Methods of Assessment

In order to assess the effects of the intervention, a student attitude survey will be administered. The survey explores student comfort level with participation and subject matter, attitudes towards acceptance by peers and teachers and awareness of gender bias in the classroom. In addition, four behavioral checklists will be used to gather data on patterns of participation and demands on teacher attention. Student observation checklists will be used to document patterns of participation in cooperative group work. Textbooks currently used in the targeted classes will be analyzed for gender bias. Finally, scoring rubrics will be developed for project assessment.

CHAPTER 4

PROJECT RESULTS

Historical Description of the Intervention

The objectives of this project were to increase equity in classroom participation and to promote positive interactions between girls and boys in the classroom. The use of assigned seating, name cards for random questioning, cooperative learning, role-playing, and debate activities were chosen as interventions designed to fulfill the project objectives.

During the first week of the school year, students were administered an attitudes survey and behavior checklists were completed in order to document the existence of gender inequities in the classroom. At this time, students were allowed to choose their own seating and cooperative groups. Patterns of gender-grouping were noted in anecdotal records.

During the second week of school, in both Sites A and B, students were assigned to a seating chart that equally distributed boys and girls. Teachers at both Sites prepared name cards to be used for random questioning of students during classroom discussion. Behavior checklists were completed on a weekly basis throughout the duration of the study.

Mixed-gender cooperative groups were established at both Sites during the second week of school and maintained throughout the intervention. At both Sites A and B, teachers developed new cooperative group activities as part of the action plan. Samples of these activities are included in Appendices E and F. At Site A, students worked in cooperative groups to research the dangers of drug use. These activities included the completion of venn diagrams and KWL graphic organizers, refusal skill skits, the creation of posters, songs, brochures, and Public Service Announcements. Other cooperative activities included brainstorming, paired partner assignments,

jigsawing, and think-pair-share discussion method. At Site B, one of the group activities involved a two-week study of the cell. Student groups completed six products including article summaries, posters, and models, and demonstrations. Other cooperative group activities included jigsawing, group tests, and a sequencing activity.

During cooperative group activities, students were randomly assigned roles. One of the roles was that of student observer whose job was to monitor participation and encouragement by all members of the group. Following each cooperative activity, students were asked to reflect on how they functioned in terms of participation by all members. The action plan originally called for weekly class discussions following small and large group activities in order to provide a forum for students to share their thoughts and experiences as they worked in cooperative groups. However, instead of whole class discussions, the teachers at Site A and Site B instructed cooperative groups to reflect on their progress within their small groups. The reasoning behind this deviation in plans was to provide more students an opportunity to voice their opinions.

Rubrics were used at both sites in order to evaluate individual and group projects. Samples are included in Appendix G. At Site A, rubrics were used to evaluate the group products created during the substance abuse avoidance unit. At Site B, cell models, group cell projects, posters, and presentations were evaluated using rubrics. The rubrics detailed specific categories that would be graded and included the points possible for each category.

At Site A, students role-played various real-life situations related to coping strategies, refusal skills, and first-aid techniques. At Site B, students conducted several debates on bioethics. Students were given a scenario and a position to debate. These cooperative group activities were designed to de-emphasize competition and speed. By giving cooperative groups product choices and flexible timeliness, both boys and girls were thoroughly engaged in their own group work.

While implementing cooperative group activities, assigned seating, name cards, and "hands-on" activities, the attitudes and behavior of students was monitored. The incidents of declarative statements, demands on teacher time and attention, and disruptive behavior by boys and girls are presented in the following section.

Presentation and Analysis of Results

Participation tally sheets, calling out tally sheet, behavior checklists, and audiotape records were used during whole class instruction and cooperative group activities in order to assess the effects of the intervention. The data were compiled monthly and are presented in Figure 3, 4, and 5.

Figure 3 documents the percentage of declarative statements made by both genders. Declarative statements include unsolicited positive comments and volunteered responses. This behavior was documented using the Calling Out Behavior Tally Sheet and the Audiotape Analysis. Figure 3 shows a steady increase in the percentage of declarative statements made by girls throughout the intervention. During September, only 30 % of declarative statements were made by girls. By the end of the intervention, there was a 13 % increase in declarative statements by girls. During this time, the actual number of declarative statements made by boys remained consistently high, thus the data reflect a real increase in declarative statements made by girls.

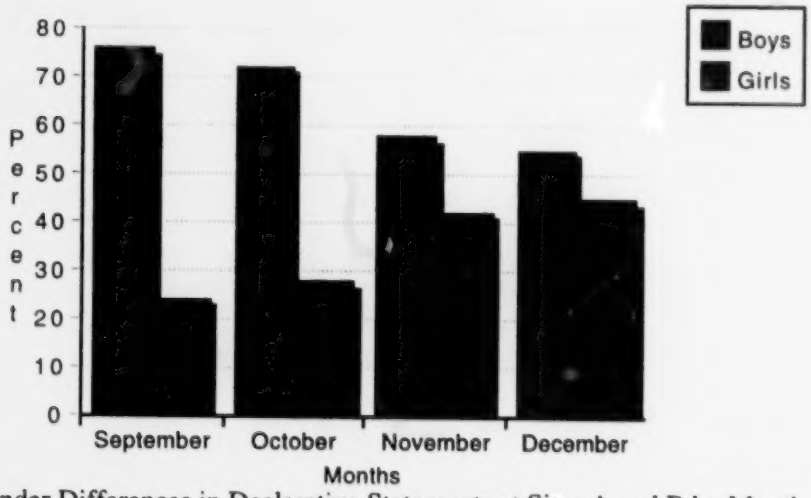

Figure 3. Gender Differences in Declarative Statements at Sites A and B by Month.

Figure 4 documents the demands on teacher time and attention by boys and girls. This behavior was documented using the Participation Tally Sheet. At the beginning of the intervention, boys monopolized teacher attention 70 % of the time. Some of this time was spent gathering

baseline data prior to the introduction of structured procedures aimed at equalizing teacher time and attention by gender. During subsequent months, demands on teacher time and attention reflected more of a balance between genders. Although, by the last month of the intervention, boys still received 10 % more of teacher time and attention than girls, this was a dramatic drop from the first month. Anecdotal records revealed an increase in group interactions with the teacher in which both genders were equally benefiting from teacher time and attention.

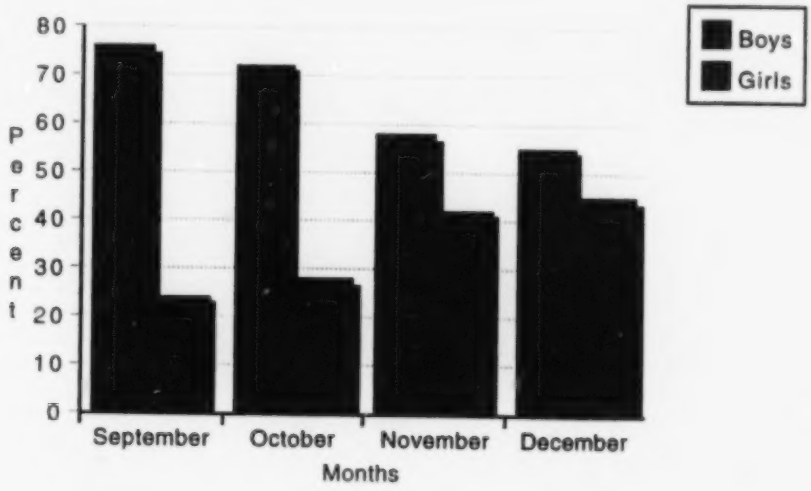

Figure 5. Gender Differences in Teacher Time and Attention at Sites A and B by Month.

The intervention appears to have had a positive effect on the number of incidents of disruptive behavior by both boys and girls. Disruptive behavior was recorded using the Behavioral Anecdotal Checklist. There was an overall decrease in the number of documented disruptive behaviors from 140 in the first month to 43 in the last month of the intervention. While the percentage of disruptive behaviors by gender appear to be equalizing throughout the course of the intervention, the numbers actually reflect a dramatic drop in the number of disruptive behaviors by boys. The number of disruptive behaviors by girls remained relatively steady during the course of the intervention.

The above data reflect definite changes in behavior of boys and girls throughout the course of the intervention. These changes are a direct result of the chosen intervention aimed at increasing

increasing equitable participation and promoting positive student interactions.

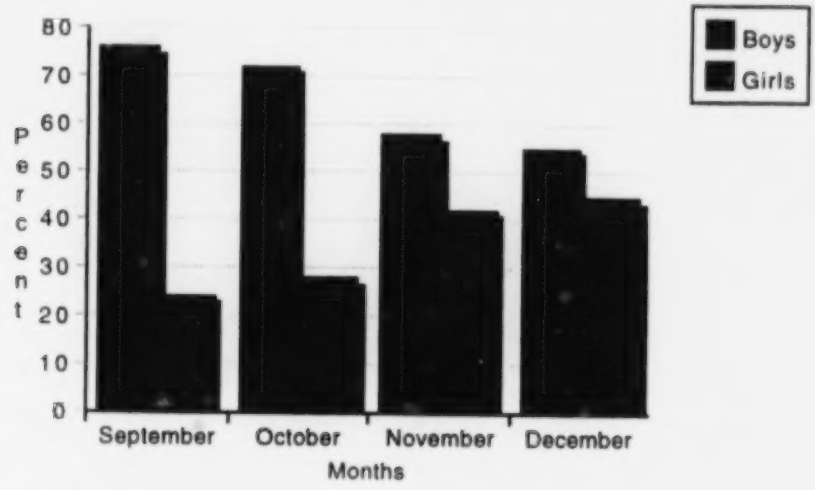

Figure 6. Gender Differences in Misbehavior at Sites A and B by Month.

Conclusions and Recommendations

Based on the observed behavior of boys and girls at Sites A and B throughout the intervention, conclusions and recommendations can be made as to what classroom practices effectively increase participation by girls and the number of positive interactions between boys and girls in the classroom.

Conclusions

The analysis of the data documenting declarative statements made by girls and boys reveals an increase in participation by girls. When students make declarative statements, they are actively engaged in the class activities and feel comfortable expressing themselves in front of their peers. A confident student tends to speak out, contribute more to class discussions, and participate at a higher level in class activities. Mixed-gender cooperative grouping, in which students are randomly assigned roles, enables students to have a wider range of experiences. Girls not only served as recorders and illustrators (which are typical self-assigned roles), but also assumed leadership and reporter roles during these "hands-on" experiences. The social skills learned in a small cooperative group setting were easily transferred to whole group interactions, increasing the

comfort level in the classroom. In addition to teacher-assigned roles, other classroom procedures increased equal participation by both genders.

The increase in participation levels by girls can also be attributed to heterogeneous seating arrangement and mixed-gender cooperative groups. These types of arrangements naturally encouraged boys and girls to interact in positive ways. The development of a set of name cards was an additional procedure that encouraged equitable participation. The name cards were used for random questioning during class discussion. An unanticipated benefit of the name cards was that students remained alert and on task.

During the first month of the intervention, boys received an inordinate amount of teacher time and attention. Some of this attention was directed at correcting off-task and disruptive behavior. In this initial data gathering period, students were allowed to choose their own cooperative groups, roles, and seating arrangement. Consequently, students were less focused on social skills and cooperation, and more focused on competition. The classroom atmosphere was less inviting and some students, particularly girls, may have felt intimidated and therefore did not demand as much teacher time and attention.

Various classroom procedures and activities helped to equally distribute teacher time and attention by gender. Cooperative grouping, incorporation of real-life situations including role-playing and debate, "hands-on" activities, teacher-assigned seating arrangements and questioning techniques all contributed to equal access to teacher time and attention. One notable result of the implementation of theses strategies was an increase in the attention devoted towards mixed-gender groups.

These same interventions, which required the use of social skills by students, naturally led to a decrease in the number of disruptive behaviors by all students. Because these strategies foster a cooperative spirit and encourage students to remain focused and on task, student interactions were more positive and less adversarial.

Based on the improvement in equitable participation by both genders documented during this intervention, several recommendations can be made. These recommendations are aimed at

helping teachers ensure equal participation by girls and boys and foster a positive classroom climate.

Recommendations

One of the easiest and most successful steps that a teacher can take to equalize participation by gender is to create a heterogeneous seating arrangement. This type of structure decreases off-task social behavior, and promotes positive interactions between girls and boys.

The use of name cards for random questioning is another easy strategy that teachers should implement in their classrooms. This technique, in conjunction with increased wait-time, requires very little effort and has the benefits of not only ensuring equal participation, but keeps students focused and on-task, and decreases unwanted calling-out.

Another essential ingredient for a gender-equitable classroom is the use of cooperative groups. Schools should provide staff development opportunities for teachers to educate them on successful techniques in the design and implementation of cooperative group activities. Teachers should build into cooperative activities the use of real-life situations, "hands-on" opportunities, rotating role assignments, and social as well as critical thinking skills. Cooperative group products should be assessed using rubrics. Students should also be encouraged to process within their own groups their level of participation and use of social skills. Research has demonstrated that these types of cooperative group activities promote girls' self-esteem and encourage their participation.

Competition should be de-emphasized in the classroom. The use of cooperative group activities in which students are given product choices and flexible time lines and the emphasis on social skills all serve to decrease a competitive atmosphere.

One of the difficulties encountered during this action research project was the resistance by students to long-term seating assignments in cooperative groups. One way to reduce this negative response is to inform students ahead of time that groups will be randomly assigned at times, and at other times chosen by the teacher.

This study confirmed previous research related to ensuring gender equity in the classroom. The results of this study demonstrated that when efforts are made to encourage and promote

equitable participation through the use of a broad range of structured activities, modified teacher strategies and behaviors, and expanded opportunities for social, emotional, and intellectual growth, girls show a dramatic increase in participation and leadership. In order to achieve gender equity in society, it must first take root at home and in school. The classroom teacher plays a critical role in ensuring gender equity not only in the classroom, but in the lives of the students who will shape society in the future.

THE REFERENCE LIST

Ambrose, M. W. (1996, September). Do you cheat the girls? Learning, 25 (2), 72-75.

Bailey, S. M. (1996). Shortchanging girls and boys. Educational Leadership, 53, 75-79.

Berliner, D., & Casanova, U. (1993). Putting research to work in your school. Arlington Heights, IL: IRI/Skylight.

Best, R. (1983). We've all got scars: What boys and girls learn in elementary school. Bloomington, IN: Indiana University Press.

Bullock, M. (1996). Reversing underachievement in the classroom. USA Today (Magazine), 125, 66-67.

Byfield, T. (1995). Is there gender bias in the schools? You bet: Add up the teaching staffs. Western Report, 22, p. 52.

Chandler, P. (1994). The gender equity quiz. Learning, 23 (4), p. 57.

Coates, K. (1997, May). Separating the sexes is wrong. [Letter to the editor]. The Forest Scout, 55 (8), p. 4.

Cowher, S. (1995). Recognizing and addressing gender issues in the classroom. Journal of Humanistic Education & Development, 34, 35-42.

Cronin, C., & Sawsan, J. (1995). Effects of modeling on the use of nonsexist language among high school freshpersons and seniors. Sex Roles, 33, 819-830.

Dweck, C., Davidson, W., Nelson, S., & Enna, B. (1978). Sex differences in learned helplessness: II. The contingencies of evaluative feedback in the classroom and III. an experimental analysis. Developmental Psychology, 14, 268-276.

Eisler, R., Loye, D., & Norgaard, K. (1995) Women, men, and the global quality of life. WIN News, 21 (4), 80.

Flynn, V., & Chambers, R. (1994). Promoting gender equity: What you can do. Learning, 23 (4), 58-59.

Hannan, D. (1995). Gender equity in the American classroom: Where are the women? English Journal, 25, 103-104.

Honey, M., & Bennett, D. (1994). No girl is an island: Girls in science and technology often feel alone. Electronic Learning, 13, 16-17.

Kline, T. (1995). Cooperativeness and competitiveness: Dimensionality and gender specificity of the classroom life. Educational & Psychological Measurement, 55, 335-340.

Kyrene School District's Gender Equity Web-Site. (1997) Http://www. kyrene.k12.az. us/schools/ Centennial/gender.htm#tips.

Lightbody, P., Siann, G., Stocks, R., & Walsh, D. (1996). Motivation and attribution at secondary school: The role of gender. Educational Studies, 22 (1), 13.

Lummis, M., & Stevenson, H. (1990). Gender differences in beliefs and achievement: A cross-cultural study. Developmental Psychology, 26, 254-263.

Merenbloom, E. (1992). The mindful middle school: A shifting paradigm. In A. Costa, J. Bellanca, and R. Fogarty (Eds.), If minds matter: Vol. II. Designs for change. (pp. 151-160). Palatine, IL: IRI/Skylight.

McDaniel, T. (1994). The education of Alice and Dorothy: Helping girls to thrive in school. The Clearing House, 67 (5), 288-291.

McKnight-Taylor, M. (1994). Children need stimulating classroom and autonomy. Childhood Education, 71, 96.

Ochman, J. (1996). The effects of nongender-role stereotyped, same-sex role models in storybooks on the self-esteem of children in grade three. Sex Roles, 35, 711-731.

Ostling, R. N., & Urquhart, S. (1992, February 24). Is school unfair to girls? Time, 139 (8), 62.

Philbin, M., Meier, E., Huffman, S., & Boverie, P. (1995). A survey of gender and learning styles. Sex Roles, 32, 485-494.

Pollina, A. (1990). Closing the gender gap: Helping girls excel in science and math. Instructor, 105 (6), 54.

Sadker, D., & Sadker, M. (1994). Failing at fairness: How America's schools cheat girls. New York: Macmillan.

Schrof, J., (1993). The gender machine: Congress is looking for ways to remove old barriers to girls' success. U.S. News & World Report, 115 (5), 42-45.

Schorr, M. (1996). Does gender equity promote prosperity, or vice versa? Working Woman, 21, 18.

Sonnert, G. (1995). Gender equity in science: Still an elusive goal. Issues in Science and Technology, 12 (2), 53-59.

Thorne, B. (1993). Gender play: Girls and boys in school. New Brunswick, NJ: Rutgers University Press.

U.S. Census Bureau: The office of Statistics. (1990). Http://ftp.census.gov/cgi-bin/gazetteer?city=Highland+Park&state=IL.

U.S. Census Bureau: The office of Statistics. (1990). Http://ftp.census.gov/cgi-bin/gazetteer?city=Lake+Bluff&state=IL.

U.S. Census Bureau: The office of Statistics. (1990). Http://ftp.census.gov/cgi-bin/gazetteer?city=Lake+Forest&state=IL.

U.S. Department of Education (1996). Edgewood Middle School. School Report Card. K-8 D Version.

U.S. Department of Education (1996). Lake Forest High School. School Report Card. 9-12 D Version.

Wellesley College Center for Research on Women. (1992). How schools shortchange girls: The AAUW report. Washington, DC: American Association of University Women Educational Foundation.

Wolf, N. (19910. The beauty myth: How images of beauty are used against women. New York: Doubleday.

Yepez, M. (1994). An observation of fender-specific teacher behavior in the ESL classroom. Sex Roles, 30 , 121-134.

APPENDIX A

AUDIOTAPE ANALYSIS

Audiotape Analysis

Date: _____
Subject: _____
Class Period: _____

Classroom Setting:

	Teacher Question	Student Question	Student Comment (+/-)	Student Answer (V/F)	Teacher Response (P, C, R, A)	Comments
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						

KEY

B = boy
G = girl
+ = positive comment
- = negative comment

V = voluntary
F = forced

Teacher Responses:
P = constructive praise
C = negative criticism
R = remediation
A = neutral acceptance

APPENDIX B

BEHAVIORAL ANECDOTAL CHECKLIST

Behavioral Anecdotal Checklist

Date_____

Subject_____

Class Period_____

BEHAVOIR	B	G
Off-task behavior during group work		
Speaking during group work		
Recorder/Illustrator (Self-Assigned)		
Put Downs		
Encouragement/ Helpful Behavior		
Non-participation		
Disruptive Behavior		
Other Notable Behavior		

APPENDIX C

CALLING-OUT BEHAVIOR TALLY SHEET

Calling -Out Behavior
Tally Sheet

Date _____

Subject_____

Class Period_____

	B	G
Calling Out		

APPENDIX D

PARTICIPATION TALLY SHEET

Participation Tally Sheet

*Date*_____

Subject_____

Class Per._____

Time	Student Interacting With Teacher	Large Group Interaction	No Student Interaction
0 - 10			
10 - 20			
30 - 40			
40 - 50			

APPENDIX E

SITE A COOPERATIVE GROUP ACTIVITY

All Systems Go! Project

Background

The health of your body systems is very important for your total health and wellbeing. Your body systems control body functions such as digestion, the circulatory system, respiratory system, skeletal system, muscular system, digestive system, endocrine system, and reproductive system. Each system is made up of many parts that work together. Your diet, physical fitness, and personal habits can contribute to the health of each of these systems and help prevent some diseases that are associated with them.

Task

You and your partner will create a product that explains one of the eight body systems. Your product should identify the main parts of the body system and summarize how that body system works. Your product will also include a Systems Check feature that tells what steps people can take to help keep the system healthy. Product choices include:

1. A chart
2. A poem
3. A Board Game
4. A Mobile Display

To organize your information and to draw interest in the chart, poem, board game or mobile display your project should include the following:

a. A Title
b. A description of the body system
c. A summary of how the system works
d. A systems watch feature: (how to keep system healthy) A list of activities, behaviors and lifestyle choices that can maintain the health of this system
e. A list of common diseases and disorders that affect this system
f. An illustration: photographs, pictures from magazines, drawings, graphic organizers.

Venturing To A New "gLand"

**The endocrine system is needed to grow,
but first there are some things
that you need to know.**

**The system includes the pituitary gland.
You need it to grow,
it is in high demand.**

**Thyroid, adrenal, parathyroids too;
each is a gland,
an important part of you.
Pancreas, ovaries, testes,
are just a few more
parts of this system
that make your body function.
That's what they are for!**

**Diabetes, goiter,
GROWTH EXTREMES too.**

**To avoid these disorders,
there are things you can do:**

**Reduce your stress,
eat healthy every day,
and all of these problems
could soon go away!**

APPENDIX F

SITE B COOPERATIVE GROUP ACTIVITY

Student Observation Tally Sheet Student Observer_____

Make a tally mark each time you observe these behaviors occur

	Group Members			
Names / **Social Skill**				
Contributed Ideas				
Expresses support				
Encourages others to contribute				
Gives direction to group members				

Group Summary

What was our group supposed to do?

What did our group do well?

Did our group members contribute ideas equally? If not, why not?

What could we improve on?

APPENDIX G

SAMPLE RUBRICS

KWL Rubric

Group Members_____ _____
Class Period_____ **Date**_____

ATTRIBUTE	WOW	OK	NOT YET
Neatness	Great care shown	Some care shown	Little or no care shown
Title	Prominent	Not prominent	No title
	Descriptive	Somewhat descriptive	Not descriptive
Columns	Evenly divided	Unevenly divided	Not divided
	All columns labeled	Some labeled	Not labeled
	Effective use of color	Some use of color	Little or no color used
K Information (What we know)	More than six items listed	Six items listed	Less than six items listed
W Information (what we want to know)	More than six questions listed	Six questions listed	Less than six questions listed
L Information (what we learned)	More than six facts listed	Six facts listed	Less than six facts listed

Scoring Rubric

Cell Model

Points	8	7	6	5	4
Organelles and Cell Structures	All required structures are present. Additional structures are also present and labeled, 3-D, great effort is evident	All required structure are present. 3-D great effort is evident	Almost all structure are present. 3-D, good effort is evident	Some missing structures. 3-D	Some structures are missing 2-D
Organelle Appearance	Student has added to or modified an object to resemble a true organelle. Neat in appearance, great effort evident	Resembles a true organelle. Neat in appearance.	Most organelles are neat in appearance, some relation to actual appearance	Little relation to actual appearance	Shows lack of effort
Key	Typed, clear, neat correct, complete, on the model	Typed, on the model, complete, could be neater and more clear	Typed, not on model, could be neater and more clear	Not typed, sloppy, unclear	Not typed, incomplete, sloppy
Creativity and Craftsmanship	Model shows a creative use of materials, is colorful, is three dimensional, construction shows great effort, very neatly presented	Creative use of materials, colorful, 3-D, neatly presented	Creative use of materials, 3-D, colorful, could be more carefully constructed	Some creativity is evident, could be more carefully constructed, 2- or 3-D	Sloppy